



GENALYSIS

LABORATORY SERVICES
PTY LTD

Schedule of Services and Charges

July 2009



A MEMBER OF THE **Intertek** GROUP

GENALYSIS LABORATORY SERVICES PTY LTD

A.B.N. 32 008 787 237

PERTH

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Our commitment to supporting and adding value for our customers drives everything we do. We deliver innovative solutions to facilitate our customers' success in the global marketplace and, most importantly, we provide our customers with confidence.

By leveraging our local service and global network, we enable our customers to dedicate their primary energies to their core business activities. We offer comprehensive programmes and services which draw on our industry specific knowledge and technical expertise.

At Genalysis, and as individuals, we:

- Value trust and personal responsibility;
- Act with integrity, honesty and respect;
- Deliver excellent services which add value to our customers' business;
- Focus on continual growth and outstanding performance;
- Strive to create a safe work environment;
- Promote a culture where motivated customer-orientated employees can flourish, experience professional fulfilment and reach their highest potential;
- Respect diverse perspectives, experiences and traditions as essential.

Our commitment to delivering outstanding results through sound and thorough financial practices, superior profitability, stable growth and good citizenship will enable us to fulfil our mission while increasing sustainable shareholder value.



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Genalysis maintains a staff of experienced personnel with extensive industry knowledge to support the exploration and mining industry.

Our areas of particular expertise include analytical chemistry, geochemistry, geology, quality assurance, data interpretation, laboratory design and development.

Please contact us to discuss any analytical requirements not listed in this schedule.

QUALITY ASSURANCE AND CONTROL

ACCREDITATION

The ISO/IEC 17025 accreditation ensures international standards are maintained in the laboratories' procedures, methodology, validation, QA/QC, reporting and record keeping. National Association of Testing Authorities Australia (NATA) has accredited Genalysis Laboratory Services Pty Ltd, following demonstration of its technical competence, to operate in accordance with ISO/IEC 17025 which includes the management requirements of ISO 9001:2000. This facility is accredited in the field of Chemical Testing for the tests, calibrations and measurements shown in the Scope of Accreditation issued by NATA (Accreditation No. 3244).

Genalysis also participates in a number of regular international, national and internal proficiency round robins and client specific proficiency programs.

ANALYSIS QUALITY CONTROL

Certified Reference Materials and/or in house controls, blanks, splits and replicates are analysed with each batch of samples. These quality control results are reported along with the sample values in the final report. Selected samples are also re-analysed to confirm anomalous results.

Where the concentration of an element exceeds the capacity of the original method selected, then re-analysis will be required using a more appropriate digestion technique and analytical finish at the client's expense.

REPORTING

In addition to mailed hard-copy reports, electronic data transfer via email is available. We recommend that data to be transmitted by email be encrypted for security purposes. Standard data formats available include CSV, Excel, Text and SIF. Other non-standard formats and other services may be available upon request.

LABORATORY INFORMATION MANAGEMENT SYSTEM (LIMS)

A sophisticated Laboratory Information Management System (LIMS) is in place for sample tracking, scheduling, quality control and electronic reporting.

LABTRACK

Labtrack enables online live job status through a secure and personalised login.

METHOD OF ANALYSIS CODES

AAS	Flame Atomic Absorption Spectrometry
CALC	Results determined by calculation using other reported data
COL	Colourimetry
CVAP	Cold Vapour Generation Atomic Absorption Spectrometry
EETA	Enhanced sensitivity Graphite Furnace Atomic Absorption Spectrometry
EMS	Enhanced sensitivity Inductively Coupled Plasma Mass Spectrometry
EOES	Enhanced sensitivity Inductively Coupled Plasma Optical (Atomic) Emission Spectrometry
ETA	Graphite Furnace Atomic Absorption Spectrometry
GPYCN	Density measurement using a Gas Pycnometer
GRAV	Gravimetric method
IR	Infrared analyses using induction furnace
METER	Electronic meter measurement
MS	Inductively Coupled Plasma Mass Spectrometry
NEPH	Nephelometer
NES	Nessler Tube Comparator
OES	Inductively Coupled Plasma Optical (Atomic) Emission Spectrometry
SAAS	Flame Atomic Absorption Spectrometry after extraction of analyte into organic solvent
SIE	Selective Ion Electrode
SPEC	Specific analytical finish for requested species
VOL	Volumetric technique
WGHT	Weight determination using a balance
XRF	X-ray fluorescence

LIMITS OF DETECTION

Throughout this schedule the figures in brackets after each element symbol are lower limits of detection for that element/method combination in parts per million (i.e. mg/kg for solid samples and mg/l for solutions) unless otherwise stated.

Detection limits quoted are those that can be realistically achieved under normal routine operating conditions.

Lower limits of detection may be achieved for some elements under special operating conditions. Occasional difficult sample matrices may result in elevated detection limits.

PRICES

All prices quoted in this schedule are in Australian dollars and exclude Australian Goods and Services Tax.

The prices contained in this schedule are effective from July 2009.

SAMPLE PREPARATION

Sample preparation is an essential stage in the analytical process. The correct preparation procedures aim to produce a representative homogenous sub sample, and are the initial steps in obtaining meaningful analytical data.

Selection of the actual sample preparation procedures will depend on the type and size of the sample, mineralogy, analytical requirements and your budget.

We have separate dedicated areas for high and low level sample preparation at most of our facilities.

SPECIAL HANDLING

SUBMISSION OF HAZARDOUS SAMPLES

Genalysis has policies and procedures in place to safely process samples that are radioactive, contain asbestiforms, or other hazardous materials. As a client sending samples to Genalysis, you have a duty of care to inform Genalysis if your samples contain any hazardous materials. This allows Genalysis to protect our employees and ensure that they are not exposed to hazards in the workplace.

Please ensure that the sample submission is clearly endorsed, describing the category of hazard and clearly mark the samples that contain the hazard. A dangerous goods form is available to download from our website (www.genalysis.com.au) which should accompany such samples. We appreciate that at times it may be difficult to identify a hazard, but please err on the side of caution.

NATURALLY OCCURRING RADIOACTIVE MATERIAL (NORM)

Samples requiring preparation Additional charge of \$0.60 /sample

Samples received as pulps Additional charge of \$0.30 /sample

By regulations, all radioactive material must be returned to the company, at their expense.

SAMPLES CONTAINING FIBROUS MATERIAL (ASBESTOS)

Samples requiring preparation Batch fee \$150.00 plus an additional charge of \$1.00 /sample

Samples received as pulps Batch fee \$30.00 plus an additional charge of \$0.50 /sample

SAMPLE PREPARATION - AUSTRALIA

SORTING AND DRYING

Sorting and drying of samples prior to preparation \$0.50 /kg

(Applies only to consignments that are neatly packaged and labelled; sample submissions poorly labelled or packaged will incur additional sorting charges.)

PRIMARY CRUSHING AND SPLITTING

Conventional jaw crushing to nominal minus 10mm \$0.50 /kg

Boyd jaw crushing to nominal minus 2mm \$1.50 /kg
(includes simultaneous rotary splitting if required)

PULVERISING – CONVENTIONAL PREPARATION SYSTEMS

Most devices used in the crushing and pulverising of samples can impart trace levels of contaminants to the samples for analysis. Low chrome steel is the preferred material for pulverising bowls as the iron contamination is usually negligible, compared with the iron levels commonly encountered in most geological materials. Other options such as tungsten carbide and zirconia bowls are also available if required.

Genalysis aims to achieve 85% minus 75µm using a single stage mix and grind, however the hardness of some samples is such that this may not always be achieved using standard pulverising protocols. The maximum size sample the mills can pulverise efficiently is 3kg. If fine grind is essential, please discuss sample preparation options with Genalysis prior to commencement of any project.

- | | |
|--|----------------------|
| (a) up to 300g (chrome-steel bowl) | \$ 2.00 /sample |
| (b) greater than 300g, up to 750g (chrome-steel bowl) | \$ 3.50 /sample |
| (c) greater than 750g, up to 3000g (chrome-steel bowl) | \$ 5.00 /sample |
| (d) greater than 3000g (chrome-steel bowl) | Price on application |
| (e) up to 100g (tungsten-carbide bowl) | \$ 7.00 /sample |
| (f) up to 100g (zirconia bowl) | \$10.00 /sample |

Cleaning of pulveriser after sample with gold free quartz 75% of cost of pulverising

AUTOMATED PREPARATION – ROBOTIC (PERTH ONLY)

The use of this cutting edge technology has a number of advantages including rapid throughput, reliability, unparalleled consistency and almost complete exclusion of human error. Fully programmable comminution parameters and synchronised process control ensure that samples obtain the requisite treatment consistently.

The multi-function preparation system is capable of handling bulk samples up to 10kg with a crushing capacity to nominal minus 2mm and a grind capacity of 300g to 1.2kg. Genalysis will automatically initiate the use of one barren quartz wash between samples for all jobs unless otherwise instructed.

- (a) single stage mix and grind (one quartz wash), 300g up to 1.2kg \$3.10 /sample
- (b) crush, single stage mix and grind (one quartz wash),
300g up to 1.2kg \$3.50 /sample
- (c) crush, single stage mix and grind

Sample Weight	One Quartz Wash	No Quartz Wash
> 1.2kg < 3kg	\$5.25	\$5.00
> 3kg < 5kg	\$6.35	\$6.10
> 5kg < 7kg	\$7.50	\$7.25
> 7kg < 10kg	\$8.75	\$8.50

SIEVING/SIZING

- Dry screen partial or total sample to specified mesh size(s) \$75.00 /hour
- Wet sieving (to client's specification) \$75.00 /hour
- Screen test for sample preparation quality at a nominated aperture size \$6.00 /sample
- Multi-point determination of particle size distribution by Mastersizer
and reporting size distribution \$60.00 /sample
- Reporting weights of samples “as received” or weights
of fractions recovered \$1.50 /weight

SPECIAL PREPARATIONS

Quarantine treatment – pulps (in standard paper envelopes) *	\$1.20 /sample
Quarantine treatment - bulk samples *	\$3.00 /sample
Riffle splitting	\$75.00 / hour
Mat mixing of assay pulps submitted for check or further assays	\$1.50 /sample
Core cutting with diamond saw to client's requirements	\$100.00 /hour
Compositing of specified samples	\$75.00 /hour
Drying and desiccation of hygroscopic samples prior to weighing	\$1.50 /sample
Reporting weights of samples "as received" or post drying weight	\$1.50 /weight
Client specified preparation (Technician)	\$75.00 /hour
Client specified preparation (Chemist)	\$150.00 /hour

* Note: normal sorting and drying costs are not additionally charged

SAMPLE STORAGE

All solid samples (assay pulps, bulk pulps, and residues) will be stored without charge for 60 days after completion of analysis. After this time all samples will be stored at a rate of \$3.00 per cubic metre per day until the client's written advice regarding return, collection or disposal is received.

Samples submitted as liquids will be stored (at ambient temperature) without charge for 60 days after completion of analysis, and then discarded unless advised otherwise in writing.

Expenses related to the return of samples will be charged at cost.

Disposal of samples is charged at \$75.00 per cubic metre.

Retrieval of random samples from storage (i.e. not complete job lots) for further analyses or return to clients is charged at \$75.00 per hour.

FREIGHT

Freight expenses incurred will be passed on at cost. For further information please see "Freight of samples to Genalysis" and "Freight of samples to Genalysis from Southern and Eastern Africa" documents on our website.

SAMPLE PREPARATION – SOUTH AFRICA

SORTING AND DRYING

Sorting and boxing of samples received as pulps in:

Paper packets	\$1.20 /sample
Plastic bags	\$2.00 /sample
Sorting and drying of samples prior to preparation	\$0.60 /kg

(Applies only to consignments that are neatly packaged and labelled; sample submissions poorly labelled or packed will incur additional sorting charges.)

PRIMARY CRUSHING

Conventional jaw crushing to nominal minus 10mm	\$0.50 /kg
Boyd jaw crushing to nominal minus 2mm (includes simultaneous rotary splitting if required)	\$1.50 /kg

PULVERISING

Most devices used in the crushing and pulverising of samples can impart trace levels of contaminants to the samples for analysis. Low chrome steel is the preferred material for pulverising bowls as the iron contamination is usually negligible compared with the iron levels commonly encountered in most geological materials.

Genalysis aims to achieve 85% minus 75µm using a single stage mix and grind, however the hardness of some samples is such that this may not always be achieved using standard pulverising protocols. The maximum size sample the mills can pulverise efficiently is 3kg. If fine grind is essential please discuss sample preparation options with Genalysis prior to commencement of any project.

(a) up to 300g (chrome-steel bowl)	\$2.00 /sample
(b) greater than 300g, up to 750g (chrome-steel bowl)	\$4.00 /sample
(c) greater than 750g, up to 3000g (chrome-steel bowl)	\$6.00 /sample
(d) greater than 3000g (chrome-steel bowl)	Price on application

Cleaning of pulveriser after sample with gold free quartz	75% of cost of pulverising
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SIEVING

Dry screen partial or total sample to specified mesh size(s)	\$35.00 /hour
Wet sieving (to client's specification)	\$35.00 /hour
Reporting weights of samples "as received" or weights of fractions recovered	\$1.60 /weight

SPECIAL PREPARATIONS

Riffle splitting	\$35.00 /hour
Compositing of specified samples	\$35.00 /hour
Client specified preparation (Technician)	\$35.00 /hour

FREIGHT

(Johannesburg to Perth)

Air freight of standard Genalysis prepared assay pulp (~150g) to Perth	\$1.95 per pulp
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Air freight of samples not requiring preparation	At consolidated rates
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Genalysis will consolidate freight on a regular basis, therefore offering freight at significant discount rates.

Urgent freight consignments to Perth	At cost
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Please note that freight ex Johannesburg is not subject to client related discount.

SAMPLE STORAGE

All solid samples (assay pulps, bulk pulps, and residues) will be stored without charge for 60 days after completion of analysis. After this time all samples will be stored at a rate of \$3.00 per cubic metre per day until the client's written advice regarding return, collection or disposal is received.

Expenses related to the return of samples will be charged at cost.

Disposal of samples is charged at \$75.00 per cubic metre.

Retrieval of random samples from storage (i.e. not complete job lots) for further analyses or return to clients is charged at \$75.00 per hour.

SAMPLE PREPARATION – MADAGASCAR

SORTING AND DRYING

Sorting and boxing of samples received as pulps in:

Paper packets	\$1.60 /sample
Plastic bags	\$2.60 /sample
Sorting and drying of samples prior to preparation	\$0.80 /kg

(Applies only to consignments that are neatly packaged and labelled; sample submissions poorly labelled or packed will incur additional sorting charges.)

PRIMARY CRUSHING

Conventional jaw crushing to nominal minus 10mm	\$0.60 /kg
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FINE PULVERISING

Most devices used in the crushing and pulverising of samples can impart trace levels of contaminants to the samples for analysis. Low chrome steel is the preferred material for pulverising bowls as the iron contamination is usually negligible compared with the iron levels commonly encountered in most geological materials.

Genalysis aims to achieve 85% minus 75µm using a single stage mix and grind, however the hardness of some samples is such that this may not always be achieved using standard pulverising protocols. The maximum size sample the mills can pulverise efficiently is 3kg. If fine grind is essential please discuss sample preparation options with Genalysis prior to commencement of any project.

(a) up to 300g (chrome-steel bowl)	\$2.60 /sample
(b) greater than 300g, up to 750g (chrome-steel bowl)	\$5.20 /sample
(c) greater than 750g, up to 3000g (chrome-steel bowl)	\$7.80 /sample
(d) greater than 3000g (chrome-steel bowl)	Price on application

Cleaning of pulveriser after sample with gold free quartz	75% of cost of pulverising
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SIEVING

Dry screen partial or total sample to specified mesh size(s)	\$35.00 /hour
Wet sieving (to client's specification)	\$35.00 /hour
Reporting weights of samples "as received" or weights of fractions recovered	\$1.60 /weight

SPECIAL PREPARATIONS

Riffle splitting	\$35.00 /hour
Compositing of specified samples	\$35.00 /hour
Client specified preparation (Technician)	\$35.00 /hour

FREIGHT

Air freight of standard Genalysis prepared assay pulp (~150g) to Perth	\$2.50 /sample
Air freight of standard Genalysis prepared assay pulp (~150g) to Johannesburg	\$2.20 /sample
Air freight of samples not requiring preparation	At consolidated rates

Genalysis will consolidate freight on a regular basis, therefore offering freight at significant discount rates.

Please note that freight ex Madagascar is not subject to client related discount.

SAMPLE STORAGE

All solid samples (assay pulps, bulk pulps, and residues) will be stored without charge for 60 days after completion of analysis. After this time all samples will be stored at a rate of \$3.00 per cubic metre per day until the client's written advice regarding return, collection or disposal is received.

Expenses related to the return of samples will be charged at cost.

Disposal of samples is charged at \$75.00 per cubic metre.

Retrieval of random samples from storage (i.e. not complete job lots) for further analyses or return to clients is charged at \$75.00 per hour.

PRECIOUS METALS ANALYSIS

A diverse range of techniques are available for applications ranging from grassroots exploration, where sub ppb sensitivities are required, to accurate resource estimation and grade control. For gold determinations lead collection fire assay remains the classic method, however, aqua regia digestions, accelerated cyanide leach or BLEG are alternatives for specific purposes. Platinum and palladium can be detected using some of these methods along with gold. The full suite of platinum group elements can only be determined by nickel sulfide collection fire assay.

LEAD COLLECTION FIRE ASSAY

Lead collection fire assay using carefully selected fluxes specially formulated for the mineralogy of each sample type. Samples submitted for ppb detection of gold (and/or platinum and palladium) are fused in our dedicated low level furnaces. Some reduction in charge weight may be necessary for difficult sample matrices. Prices exclude the lead waste disposal levy.

Digestion cost (50g charge) <i>Method code FA50/</i>	\$10.00 /sample
Digestion cost (25g charge) <i>Method code FA25/</i>	\$ 9.00 /sample
Concentrates, metallurgical and shipment samples	Price on application
Elements by flame AAS	
<i>Method code FA/AAS</i>	\$1.50
Au (0.01ppm)	
Elements by solvent extraction & flame AAS (SAAS)	
<i>Method code FA/SAAS</i>	\$4.50
Au (1ppb)	
Elements by MS	
<i>Method code FA/MS</i>	
Au (1ppb) Pd (1ppb) Pt (1ppb)	
	First element \$8.00
	Subsequent elements \$0.80 each
Waste disposal levy (not subject to any discount)	\$0.50 /sample

NICKEL SULFIDE COLLECTION FIRE ASSAY

Nickel sulfide collection fire assay is formulated for the total recovery of all the platinum group elements. Some reduction in charge weight may be necessary for difficult sample matrices.

Digestion cost (25g charge)	\$65.00 /sample
Elements by MS	
<i>Method code NIS/MS</i>	
Au (5ppb) Ir (2ppb) Os (2ppb) Pd (2ppb) Pt (2ppb) Rh (2ppb) Ru (2ppb)	
	First element \$15.00
	Subsequent elements \$2.00 each
Waste disposal levy (not subject to any discount)	\$0.50 /sample

SCREEN FIRE ASSAY

A specified weight (usually 500g to 1kg) is split from the bulk pulp which is then re-pulverised to ensure oversize portion is not excessive. This sub-sample is sieved through a specified mesh size nylon cloth. The coarse fraction is weighed and the total coarse fraction, including nylon cloth, is fired and gold is determined in micrograms. The fines are homogenised and duplicate portions fire assayed and gold determined in ppm. The “weighted mean” result is calculated and reported.

Special pre-preparation of samples prior to screen fire assay	\$6.00 /sample
The most common option is for 1kg sample, dry sieved through 150 micron cloth, and duplicate 25g fire assays of the fines	\$60.00 /sample
Another option is for 1kg sample, dry sieved through 100 micron cloth, and duplicate 25g fire assays of the fines	\$75.00 /sample
Alternatively, 1kg sample, dry sieved through 75 micron cloth, and duplicate 25g fire assays of the fines	\$120.00 /sample
The above prices allow for a single pot fire of oversize	
Additional oversize firing	\$14.50 /sample
Other options	Price on application
Also applicable to silver and platinum/palladium	Price on application.
Waste disposal levy (not subject to any discount)	\$1.50 /sample

ACCELERATED CYANIDE LEACH LeachWELL™

4 hour leach using 10g LeachWELL™ tablet. Not practicable for clay rich samples.

200g leach	\$ 9.50 /sample
400g leach	\$10.50 /sample
1000g leach (two tabs)	\$17.00 /sample

Elements by solvent extraction & flame AAS (SAAS)

<i>Method code LW200/SAAS; LW400/SAAS; LW1000/SAAS</i>	\$1.50
Au (0.01)	

Elements by flame AAS

<i>Method code LW200/AAS; LW400/AAS; LW1000/AAS</i>	\$1.50
Ag (1)	

Filtration to recover clear liquor for analysis (if required)	\$7.50 /sample
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Tail recovery, entire tail washed, reground and 25g fire assay

LW200	\$27.00 /sample
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LW400	\$27.00 /sample
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LW1000	\$30.00 /sample
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Waste disposal levy (not subject to any discount)

LW200	\$0.60 /sample
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LW400	\$1.20 /sample
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LW1000	\$2.40 /sample
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BULK CYANIDE LEACH (BLEG) - LOW LEVEL GOLD

24 hour tumble leach at standard conditions formulated for oxidised surface samples containing little organic matter. Usually performed on minus 2mm unprepared samples.

0.1kg leach	\$8.00 /sample
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0.5kg leach	\$11.00 /sample
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1.0kg leach	\$13.00 /sample
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2.0kg leach	\$16.00 /sample
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4.0kg leach	\$22.00 /sample
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Elements by MS

Method code CN.1/MS; CN.5/MS; CN1/MS; CN2/MS; CN4/MS

Ag (0.1ppb)	As (0.02)	Au (0.01ppb)	Bi (0.1 ppb)	Cd (0.1ppb)	Co (0.001)	Cu (0.01)
Hg (0.5ppb)	Mo (0.1ppb)	Ni (0.01)	Pd (0.1ppb)	Pt (0.1ppb)	Zn (0.05)	
		First element			\$8.00	
		Subsequent elements			\$0.80 each	
		Hg as a subsequent element			\$2.50	

Waste disposal levy (not subject to any discount)	\$0.60 /sample
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AQUA REGIA DIGESTION

Aqua regia will attack most rock types, however silicates and refractory minerals will remain largely un-dissolved. Aqua regia is a useful tool for exploration, however, it is not suitable for resource work.

DIGESTION B (10g charge)

The digested and leached sample is vacuum filtered and diluted to volume.

Digestion cost (gold only required) \$4.50 /sample

Digestion cost (gold and other elements required) \$5.50 /sample

DIGESTION B25 (25g charge)

The digested and leached sample is vacuum filtered and diluted to volume.

Digestion cost (suitable for gold only) \$6.00 /sample

Digestion cost (gold and other elements required) \$7.00 /sample

DIGESTION B5 (50g charge)

This option involves arresting the digest and diluting to volume in the beaker.

Any insoluble residue remains in situ. Base metals using this digest are not available.

Digestion cost (suitable for gold only) \$8.00 /sample

DIGESTION RB (10g charge only)

Aqua regia digest after pre-roasting (ashing) to remove graphitic and other organic material. (Some analytes may be lost during roasting.)

Pre-roast and digestion cost (gold only required) \$7.00 /sample

Pre-roast and digestion cost (gold and other elements required) \$8.00 /sample

Elements by solvent extraction and enhanced sensitivity graphite furnace AAS (EETA)

Method code B/EETA; B25/EETA; B5/EETA; RB/EETA \$8.00

Au (0.1ppb)

Elements by solvent extraction and graphite furnace AAS (ETA)

Method code B/ETA; B25/ETA; B5/ETA; RB/ETA \$5.00

Au (1ppb)

Elements by solvent extraction and flame AAS (SAAS)

Method code B/SAAS; B25/SAAS; B5/SAAS; RB/SAAS \$1.50

Au (0.01ppm)

Elements by flame AAS

Method code B/AAS; B25/AAS; RB/AAS

Ag (0.1)	As (10)	Bi (2)	Cd (0.1)	Co (1)	Cu (1)	Mn (1)
Ni (1)	Pb (1)	Sb (2)	Te (2)	Tl (2)	Zn (1)	
					\$1.50 each	
Cr (1)	Fe (0.01%)	Mo (2)	V (10)		\$2.50 each	
Ca (0.1%)	Mg (0.1%)				\$3.50 each	

Elements by OES

Method code B/OES; B25/OES; RB/OES

Ag (1)	Al (20)	As (5)	Ba (2)	Bi (10)	Ca (0.01%)	Cd (0.5)
Co (1)	Cr (2)	Cu (1)	Fe (0.01%)	K (20)	Mg (0.01%)	Mn (1)
Mo (2)	Ni (1)	P (20)	Pb (2)	Sb (10)	Sc (1)	Sr (1)
Te (5)	Ti (5)	V (2)	Zn (1)			
			First element		\$6.00	
			Subsequent elements		\$0.60 each	

Elements by enhanced sensitivity OES (EOES)

Method code B/EOES; B25/EOES; RB/EOES

Ag (0.1)	Bi (1)	Cd (0.1)	Mo (1)	Pb (1)	Sb (1)	Te (1)
Tl (1)	W (2)					
			First element		\$6.00	
			Subsequent elements		\$0.80 each	

(If both "standard" and "enhanced" OES elements are reported, then the "first element" cost for the "enhanced" OES elements does not apply).

Elements by MS

Method code B/MS; B25/MS; RB/MS

Ag (0.05)	As (1)	Au (1ppb)	Ba (1)	Be (0.05)	Bi (0.01)	Cd (0.05)
Ce (0.01)	Co (0.1)	Cs (0.002)	Dy (0.01)	Er (0.01)	Eu (0.01)	Ga (0.05)
Gd (0.01)	Hf (0.01)	Ho (0.01)	In (0.01)	La (0.01)	Li (0.1)	Mo (0.1)
Nb (0.02)	Nd (0.01)	Pb (1)	Pd (10ppb)	Pr (0.005)	Pt (5ppb)	Rb (0.02)
Re (0.01)	Sb (0.02)	Se (1)	Sm (0.01)	Sn (0.05)	Sr (0.02)	Ta (0.01)
Tb (0.005)	Te (0.05)	Th (0.01)	Tl (0.01)	Tm (0.01)	U (0.01)	W (0.05)
Y (0.02)	Yb (0.01)	Zr (0.1)				
			First element		\$8.00	
			Subsequent elements		\$0.80 each	

Elements by enhanced sensitivity MS (EMS)

Method code B/EMS; B25/EMS; RB/EMS

As (0.1)	Se (0.2)					
			First element		\$8.00	
			Subsequent element		\$0.80	

EXPLORATION GEOCHEMISTRY

Genalysis offers a variety of multi element analytical techniques to meet the geochemical requirements of the exploration community.

A diverse array of sample decomposition techniques used in conjunction with a number of instrumental finishes ensures that the appropriate fit-for-purpose method with the requisite detection limits is available.

SAMPLE DECOMPOSITION:

One of the first considerations in choosing an exploration method is the decomposition technique to be employed. Sample decomposition techniques include acid digestion and fusions as follows:

- Aqua regia digestion
- Single and multi acid digestion
- Fusions

INSTRUMENTATION:

The most commonly used instruments are ICP-OES, ICP-MS, AAS and XRF.

ICP-OES and ICP-MS are widely used because of their convenient multi element capabilities.

AAS is a sequential technique, generally used where single element work or a small number of elements are required.

XRF using pressed powder pellets is a solid technique that does not require sample decomposition and is used for trace element analysis in exploration samples.

XRF using fused disc is mostly used for major element analysis.

ACID DIGESTS

DIGESTION A (4 ACID)

Multi-acid attack including hydrofluoric, nitric, perchloric and hydrochloric acids in teflon beakers. Suitable for dissolving silica based samples requiring low levels of detection. This digest approaches total dissolution for most minerals. Elements incorporated in highly resistant minerals may not be dissolved; these include, but are not limited to, zircon, rutile, ilmenite, tantalite, columbite, cassiterite, wolframite, spinels and some garnet species.

Digestion cost \$7.50 /sample

DIGESTION AT

As for digestion A (above) but in teflon test tubes. Not suitable for lead or silver ores. Not used for samples prepared in zirconia mill. Germanium not available by this digest. Some minor chromium and antimony losses may occur. Elements incorporated in highly resistant minerals may not be dissolved; these include, but are not limited to, zircon, rutile, ilmenite, tantalite, columbite, cassiterite, wolframite, spinels and some garnet species.

Digestion cost \$6.00 /sample

DIGESTION M (3 ACID)

Multi acid attack using nitric, perchloric and hydrochloric acids. Silica based minerals are not dissolved. This digest is not recommended for the lithophile elements.

Digestion cost \$7.00 /sample

DIGESTION RA

DIGESTION RM

Digestion A or digestion M after pre-roast (ashing) to remove graphitic and other organic material. (Some analytes may be lost during roasting.)

Digestion RA cost \$14.00 /sample

Digestion RM cost \$13.50 /sample

Elements by AAS

Method code A/AAS; AT/AAS; M/AAS; RA/AAS; RM/AAS

Ag (2)	Bi (10)	Cd (1)	Co (1)	Cu (1)	Li (1)	Mn (1)
Ni (2)	Pb (5)	Sr (10)	Te (10)	Tl (10)	Zn (1)	

\$1.50 each

Cr (5) Fe (0.01%) Mo (20) \$2.50 each

K (10) Na (10) \$3.50 each

Elements by OES

Method code A/OES; AT/OES; M/OES; RA/OES; RM/OES

Ag (1)	Al (50)	As (10)	Ba (2)	Bi (10)	Ca (50)	Ce (20)
Cd (1)	Co (1)	Cr (5)	Cu (1)	Fe (0.01%)	K (20)	La (20)
Li (2)	Mg (20)	Mn (1)	Mo (2)	Na (20)	Ni (1)	P (50)
Pb (5)	S (50)	Sb (10)	Sc (1)	Sn (10)	Sr (1)	Te (10)
Ti (5)	Tl (20)	V (2)	W (10)	Y (2)	Zn (1)	Zr (2)

First element \$6.00
Subsequent elements \$0.60 each

Elements by enhanced sensitivity OES (EOES)

Method code A/EOES; AT/EOES; M/EOES; RA/EOES; RM/EOES

Ag (0.5)	Bi (5)	Cd (0.5)	Sb (5)	Sn (5)	Te (5)	Tl (5)
W (5)						

First element \$6.00
Subsequent elements \$0.80 each

(If both "standard" and "enhanced" OES elements are reported, then the "first element" cost for the "enhanced" OES elements does not apply.)

Elements by MS

Method code A/MS; AT/MS; M/MS; RA/MS; RM/MS

Ag (0.2)	As (2)	Ba (0.1)	Be (0.1)	Bi (0.01)	Cd (0.1)	Ce (0.01)
Co (0.1)	Cs (0.05)	Dy (0.01)	Er (0.01)	Eu (0.01)	Ga (0.1)	Gd (0.01)
Ge (0.1)	Hf (0.01)	Ho (0.01)	In (0.01)	La (0.01)	Li (0.1)	Lu (0.005)
Mo (0.1)	Nb (0.05)	Nd (0.01)	Pb (2)	Pr (0.005)	Rb (0.05)	Re (0.01)
Sb (0.05)	Se (2)	Sm (0.01)	Sn (0.1)	Sr (0.05)	Ta (0.01)	Tb (0.005)
Te (0.1)	Th (0.01)	Tl (0.02)	Tm (0.01)	U (0.01)	W (0.1)	Y (0.05)
Yb (0.01)	Zr (0.1)					

First element \$8.00
Subsequent elements \$0.80 each

Elements by OES

Method code BT/OES

Ag (1)	Al (20)	As (5)	Ba (2)	Bi (10)	Ca (0.01%)	Cd (0.5)
Co (1)	Cr (2)	Cu (1)	Fe (0.01%)	K (20)	Mg (0.01%)	Mn (1)
Mo (2)	Ni (1)	P (20)	Pb (2)	S (50)	Sb (10)	Sc (1)
Sr (1)	Te (5)	Ti (5)	V (2)	Zn (1)		

First element	\$6.00
Subsequent elements	\$0.60 each

Elements by enhanced sensitivity OES (EOES)

Method code BT/EOES

Ag (0.1)	Bi (1)	Cd (0.1)	Mo (1)	Pb (1)	Sb (1)	Te (1)
Tl (1)	W (2)					

First element	\$6.00
Subsequent elements	\$0.80 each

(If both “standard” and “enhanced” OES elements are reported, then the “first element” cost for the “enhanced” OES elements does not apply).

Elements by MS

Method code BT/MS

Ag (0.05)	As (1)	Ba (1)	Be (0.05)	Bi (0.01)	Cd (0.05)	Ce (0.01)
Co (0.1)	Cs (0.002)	Dy (0.01)	Er (0.01)	Eu (0.01)	Ga (0.05)	Gd (0.01)
Hf (0.01)	Hg (0.2)	Ho (0.01)	In (0.01)	La (0.01)	Li (0.1)	Mo (0.1)
Nb (0.02)	Pb (1)	Pr (0.005)	Rb (0.02)	Re (0.01)	Sb (0.02)	Se (1)
Sm (0.01)	Sn (0.05)	Sr (0.02)	Ta (0.01)	Tb (0.005)	Te (0.05)	Th (0.01)
Tl (0.01)	Tm (0.01)	U (0.01)	W (0.05)	Y (0.02)	Yb (0.01)	Zr (0.1)

First element	\$8.00
Subsequent elements	\$0.80 each

Elements by enhanced sensitivity MS (EMS)

Method code BT/EMS

As (0.1)	Se (0.2)
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first element	\$8.00
second element	\$0.80

See also pages 19 and 20 for aqua regia multi element options including gold, platinum and palladium.

FUSION

FUSION D

Oxidative alkaline fusion using sodium peroxide flux in zirconium crucibles, with hydrochloric acid to dissolve the melt. Total dissolution for virtually all minerals.

Fusion cost \$9.00 /sample

FUSION RD

Fusion D after roasting (ashing) to remove graphitic and other organic material. (Some analytes may be lost during roasting.)

Fusion cost \$16.00 /sample

Elements by OES

Method code D/OES; RD/OES

Al (0.02%)	As (0.01%)	B (50)	Ba (20)	Ca (0.2%)	Co (20)	Cr (50)
Cu (20)	Fe (0.01%)	K (0.05%)	Mg (0.01%)	Mn (20)	Mo (50)	Ni (20)
Pb (50)	S (0.05%)	Sc (20)	Si (0.1%)	Sr (20)	Ti (0.01%)	V (50)
Y (50)	Zn (20)					

First element \$7.50
Subsequent elements \$0.75 each

Elements by MS

Method code D/MS; RD/MS

As (20)	Ba (1)	Be (1)	Bi (0.1)	Cd (10)	Ce (0.1)	Co (1)
Cs (0.05)	Dy (0.1)	Er (0.1)	Eu (0.1)	Ga (1)	Gd (0.1)	Ge (1)
Ho (0.1)	In (0.1)	La (0.1)	Li (1)	Lu (0.05)	Mo (1)	Nb (2)
Nd (0.1)	Pb (20)	Pr (0.05)	Rb (0.5)	Re (0.1)	Sb (0.5)	Se (20)
Sm (0.1)	Sn (0.01%)	Sr (20)	Ta (0.1)	Tb (0.05)	Te (1)	Th (0.1)
Tl (0.2)	Tm (0.1)	U (0.1)	W (1)	Y (0.5)	Yb (0.1)	

First element \$10.00
Subsequent elements \$1.00 each

FUSION DX

Oxidative alkaline fusion using sodium peroxide flux in nickel crucibles, with hydrochloric acid to dissolve the melt. Total dissolution for virtually all minerals. The detection limits quoted for the heavy rare earth elements may increase in the presence of high concentrations of the light rare earth elements due to polyatomic interferences on the ICPMS.

Fusion cost \$12.00 /sample

Elements by OES

Method code DX/OES

Al (0.02%)	As (0.01%)	B (50)	Ba (20)	Ca (0.2%)	Cr (0.02%)	Cu (0.05%)
Fe (0.01%)	K (0.05%)	Mg (0.01%)	Mn (0.2%)	P (0.01%)	Pb (50)	S (0.05%)
Sc (20)	Si (0.1%)	Sr (20)	Ti (0.05%)	V (50)	Y (50)	Zn (0.02%)
Zr (20)						

First element \$7.50
Subsequent elements \$0.75 each

Elements by MS*Method code DX/MS*

Ag (2)	As (20)	Ba (1)	Be (1)	Bi (0.1)	Cd (1)	Ce (0.1)
Cs (0.05)	Dy (0.1)	Er (0.1)	Eu (0.1)	Ga (1)	Gd (0.1)	Hf (0.1)
Ho (0.1)	In (0.1)	La (0.1)	Li (1)	Lu (0.05)	Nb (10)	Nd (0.1)
Pb (20)	Pr (0.05)	Rb (0.5)	Re (0.1)	Sb (0.5)	Se (20)	Sm (0.1)
Sn (2)	Sr (20)	Ta (0.1)	Tb (0.05)	Te (1)	Th (0.1)	Tl (0.2)
Tm (0.1)	U (0.1)	W (1)	Y (0.5)	Yb (0.1)	Zr (5)	

First element	\$10.00
Subsequent elements	\$1.00 each

FUSION DH

Carbonate fusion in nickel crucible specific for fluoride, determined by SIE.

Method code DH/SIE

\$36.00 /sample

F (50)

ORE GRADE ANALYSIS

Analysis of ores, concentrates and high grade material.

DIGESTION AX

Multi-acid attack including hydrofluoric, nitric, perchloric and hydrochloric acids in teflon beakers specifically for high-precision ore-body evaluation of base metals, in particular. This digest approaches total dissolution for most minerals, but elements incorporated in highly resistant minerals may not be completely dissolved.

Digestion cost

\$8.50 /sample

DIGESTION MX

Multi-acid attack using nitric, perchloric and hydrochloric acids in teflon beaker, specifically for high-precision ore-body evaluation of base metals. Silica based minerals are not dissolved.

Digestion cost

\$8.00 /sample

Elements by AAS

Method code AX/AAS; MX/AAS

Ag (5)	Cd (5)	Co (0.01%)	Cu (0.01%)	Fe (0.01%)	Ni (0.01%)	Pb (0.01%)
Zn (0.01%)						\$2.00 each

Elements by OES

Method code AX/OES; MX/OES

Ag (20)	Al (0.05%)	As (50)	Ba (20)	Ca (0.01%)	Cd (10)	Co (20)
Cr (20)	Cu (10)	Fe (0.01%)	K (0.02%)	Mg (0.02%)	Mn (10)	Mo (20)
Na (0.02%)	Ni (10)	P (0.02%)	Pb (50)	S (0.01%)	Sc (20)	Sn (100)
Sr (10)	Ti (50)	V (0.01%)	Y (50)	Zn (10)	Zr (20)	

First element	\$6.00
Subsequent elements	\$0.60 each

Additional elements are available on request.

SPECIALISED METHODS

MERCURY ANALYSIS

DIGESTION CM

Controlled temperature nitric and perchloric acid oxidative attack, specific for mercury.

Digestion cost \$3.50 /sample

Elements by CVAP

Method code CM/CVAP

Hg (0.01)

\$10.50

Elements by MS

Method code CM/MS

Hg (0.2)

\$8.00

SELENIUM ANALYSIS

DIGESTION BP

Aqua regia digest followed by pre-concentration procedure specifically for very low detection of selenium by MS.

Method code BP/MS

Se (0.01)

\$28.00 /sample

CHLORIDE ANALYSIS

DIGESTION CC

Sodium carbonate leach specific for extraction of chloride determined by COL.

Method code CC/COL

Cl (0.02%)

\$33.00 /sample

BARIUM AND STRONTIUM ANALYSIS

FUSION DP

Alkaline oxidative fusion using a sodium peroxide and sodium carbonate flux; specifically for determination of total barium and strontium, by OES.

Method code DP/OES

Ba (20) Sr (20)

First element

Second element

\$18.50 /sample

\$0.75

DIGESTION EDTA

Extraction with organic chelating reagent specific for barium in barite, determined by OES

Method code EDTA/OES

Ba (2)

\$15.00 /sample

GRAVIMETRIC DETERMINATIONS

Loss on drying (105°C or client nominated temperature)	\$7.50 /sample
Loss on ignition (1000°C or client nominated temperatures)	
First temperature	\$8.00 /sample
Subsequent temperatures	\$2.00 each
Specific gravity	
(a) Core and rocks (simple samples)	\$12.00 /sample
(b) Core and rocks (difficult samples)	\$25.00 /sample
(c) Pulps (gas pycnometer method)	\$7.00 /sample

CARBON AND SULFUR ANALYSIS

DETERMINATIONS USING CS ANALYSER

Specific for determination of total carbon and total sulfur. (Some elemental sulfur may be lost during the analysis.)

Total carbon (0.01%)	Total sulfur (0.005%)	
	First element	\$12.00 /sample
	Second element	\$7.00
Total carbon (>40%C)		\$24.00 /sample
Total sulfur (>30%S)		\$24.00 /sample
Organic plus elemental carbon (0.01%)		\$30.00 /sample
TIC total inorganic carbon (0.01%)		\$30.00 /sample
(TIC = carbon from carbonates of Na, K, Ca and Mg)		

SULFUR SPECIATION S-SO₄

HCl digest for soluble sulfates (not Ba, Sr and Pb), sulfur determined by OES

Method code SO/OES \$18.50 /sample

Sodium carbonate extract for soluble sulfate, sulfur determined by GRAV

Method code Na₂CO₃/GRAV \$42.00 /sample

XRF

XRF is the preferred technique for determination of the major element oxides as well as some trace elements, particularly those with solubility issues. Two principal sample pretreatment techniques are used; pressed powder and fused disc. Pressed powders are generally used for determining trace elements but these analyses may be subject to particle size and matrix effects which increase analytical uncertainty, particularly in the light elements. Fusion techniques reduce the matrix effects and eliminate particle size effects; providing more precise major element data, however dilution makes this generally less suitable for trace elements.

SAMPLE PRETREATMENT AND ANALYSES

The prices below do not include the primary sample preparation; however prices do include the appropriate fusion or pressed powder pretreatment for analysis by XRF.

THERMO GRAVIMETRIC ANALYSIS (TGA)

Thermo gravimetric analysis or loss on ignition (LOI) is performed using programmable furnaces with an integral balance, at a range of different temperatures; applicable for gravimetric determinations from moisture through to ashing of samples and various intermediate stages. Single point LOI determinations will be measured at 1000°C, unless otherwise specified.

FUSION

FUSION DISC PREPARATION

The sample is mixed with a suitable flux (usually lithium borate mixtures) and fused. The product is poured into a mould to obtain a homogenous fused disc.

FUSION PACKAGES

Additional elements and variations in detection limits and reporting format are available on request.

Prices are per sample.

FS/XRF01 – WHOLE ROCK

Al ₂ O ₃ (0.01%)	CaO (0.01%)	Cr ₂ O ₃ (0.005%)	Fe ₂ O ₃ (0.01%)	K ₂ O (0.01%)	MgO (0.01%)
MnO (0.005%)	Na ₂ O (0.01%)	P ₂ O ₅ (0.001%)	SiO ₂ (0.01%)	TiO ₂ (0.01%)	
LOI (single point)					Price \$30.00
LOI (4 point option)					Additional \$5.00

FS/XRF02 – WHOLE ROCK PETROLOGY SUITE

SiO ₂ (0.01%)	TiO ₂ (0.01%)	Al ₂ O ₃ (0.01%)	Fe ₂ O ₃ (0.01%)	MnO (0.005%)	MgO (0.01%)
CaO (0.01%)	Na ₂ O (0.01%)	K ₂ O (0.01%)	P ₂ O ₅ (0.001%)		
LOI (1000°C)					Price \$30.00

FS/XRF10 – IRON ORE BASIC SUITE

Fe (0.01%)	Al ₂ O ₃ (0.01%)	CaO (0.01%)	Cr ₂ O ₃ (0.005%)	K ₂ O (0.01%)	MgO (0.01%)
Mn (0.005%)	Na ₂ O (0.01%)	P ₂ O ₅ (0.001%)	S (0.002%)	SiO ₂ (0.01%)	TiO ₂ (0.01%)
LOI (single point)					Price \$30.00
LOI (4 point option)					Additional \$5.00

FS/XRF11 – IRON ORE EXTENDED SUITE

Fe (0.01%)	Al ₂ O ₃ (0.01%)	CaO (0.01%)	Cr ₂ O ₃ (0.01%)	K ₂ O (0.01%)	MgO (0.01%)
MnO (0.005%)	Na ₂ O (0.01%)	P ₂ O ₅ (0.001%)	S (0.002%)	SiO ₂ (0.01%)	TiO ₂ (0.01%)
As (10)	Ba (50)	Cl (0.002%)	Co (100)	Cu (20)	Ni (50)
Pb (50)	Sn (50)	Sr (10)	V (50)	Zn (20)	Zr (10)
LOI (single point)					Price \$35.00
LOI (4 point option)					Additional \$5.00

FS/XRF20 – NICKEL LATERITE

Ni (50)	Co (50)	Al ₂ O ₃ (0.01%)	CaO (0.01%)	Cr ₂ O ₃ (0.005%)	Fe ₂ O ₃ (0.01%)
K ₂ O (0.01%)	MgO (0.01%)	MnO (0.005%)	Na ₂ O (0.01%)	P ₂ O ₅ (0.001%)	SiO ₂ (0.01%)
TiO ₂ (0.01%)	Cl (0.002%)	Cu (20)	Zn (20)		
LOI (single point)					Price \$30.00

FS/XRF30 – ALUMINIUM ORE (BAUXITE)

Al ₂ O ₃ (0.01%)	Ba (100)	CaO (0.01%)	Cr ₂ O ₃ (0.005%)	Fe ₂ O ₃ (0.01%)	K ₂ O (0.01%)
MgO (0.01%)	MnO (0.005%)	Na ₂ O (0.01%)	P ₂ O ₅ (0.001%)	S (0.002%)	SiO ₂ (0.01%)
TiO ₂ (0.01%)	V (50)	Zr (100)	Ga (10)		
LOI (single point)					Price \$30.00

FS/XRF40 – CHROMITE ORE

Cr ₂ O ₃ (0.01%)	Al ₂ O ₃ (0.01%)	CaO (0.01%)	Fe ₂ O ₃ (0.01%)	K ₂ O (0.01%)	MgO (0.01%)
MnO (0.005%)	Na ₂ O (0.01%)	P ₂ O ₅ (0.001%)	S (0.002%)	SiO ₂ (0.01%)	TiO ₂ (0.01%)
V (50)					
LOI (single point)					Price \$40.00

FS/XRF50 – MANGANESE ORE

Mn (0.005%)	Al ₂ O ₃ (0.01%)	BaO (100)	CaO (0.01%)	Cr ₂ O ₃ (0.002%)	Fe ₂ O ₃ (0.01%)
K ₂ O (0.01%)	MgO (0.01%)	Na ₂ O (0.01%)	P ₂ O ₅ (0.001%)	S (0.002%)	SiO ₂ (0.01%)
TiO ₂ (0.01%)	Cu (20)	Pb (50)			
LOI (single point)					Price \$35.00

FS/XRF60 – URANIUM ORE

U (20)					Price \$35.00
Additional elements are available on request					

PRESSED POWDER

PRESSED POWDER PREPARATION

The pulverized sample is mixed with suitable binder, homogenized and pressed into a pellet.

SELECTED ELEMENTS BY PRESSED POWDER AND SEQUENTIAL XRF

PP/XRF01 – TRACE ELEMENTS

As (5)	Ba (10)	Bi (10)	Co (20)	Cr (20)	Cu (10)
Ga (5)	Hf (5)	Mn (50)	Mo (5)	Nb (5)	Ni (10)
P (10)	Pb (5)	Rb (5)	Sb (4)	Se (4)	Sn (5)
Sr (5)	Ta (5)	Te (5)	Th (5)	Ti (50)	U (5)
V (20)	W (5)	Y (5)	Zn (10)	Zr (5)	

Detection limits may vary with sample matrix.

Lower detection limits may be available for some elements however additional charges will apply.

First element	\$15.00 /sample
Subsequent elements	\$1.00 each

PP/XRF02 – TRACE ELEMENTS

Samples with over range elements (>4000ppm) from PP/XRF01 will be diluted and rerun.

First element	\$15.00 /sample
Subsequent elements	\$1.00 each

PRESSED POWDER PACKAGES

Prices are per sample.

PP/XRF10 – URANIUM EXPLORATION SUITE

U (5)	Rb (5)	Sr (5)	Th (5)	Price \$12.00
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Suitable for light matrices such as silicates and calcretes.

U > 4000ppm will be analysed by PP/XRF02 unless advised otherwise.

PP/XRF11 – URANIUM EXTENDED SUITE

Capable of determining U >4000ppm and additional elements, with more robust matrix correction, including LOI.

U (5)	Rb (5)	Sr (5)	Th (5)	Price \$17.00
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Additional Elements				Price \$1.00 each		
CaO (0.01%)	K ₂ O (0.01%)	MgO (0.01%)	Ba (10)	Fe (0.01%)	Mn (50)	Mo (5)
Nb (5)	P (10)	Pb (5)	S (0.01%)	V (20)	Ti (50)	

PARTIAL DIGEST GEOCHEMISTRY TerraLeach™

Genalysis has developed an extensive suite of partial digest solutions to cover a wide variety of regolith terrains and element suites. The digest solutions contain a variety of complexing agents, weak acids, weak bases or salts, in various combinations. The low total dissolved salt content for many of the digests enables determination of trace elements to very low detection levels.

Before commencing any new partial digest geochemistry program we recommend consultation with Genalysis (initial consultation is free). An orientation study to help select the optimum sample media and digestion technique is a good investment.

PREPARATION

Raw samples are air dried, and up to 100g may be digested, generally without further preparation. Some sieving to recover the finer fraction may be useful in certain terrains.

DIGESTION TL0

A de-ionised water leach for water-soluble species. Potentially useful in salt lake environments or in acid soils.

DIGESTION TL1

Our most popular partial digest where Au is the prime element of interest. For fine particulate Au and ionic Au, and very efficient for pathfinder elements Cu, Ag, Ni, Co, Hg, As, Se, Mo, Sb and W. Some other base metals may be recovered from acidic soils depending on speciation of metals in those soils.

DIGESTION TL2

A weak acid/complexing agent based digest specific for base metals in non-alkaline soils.

DIGESTION TL3

A very weak acid based digest designed to de-sorb base metals and other elements in non-alkaline soils.

DIGESTION TL4

A relatively strong digest using a weak acid/complexing agent mix; particularly effective for the recovery of Pb and Zn in alkaline soils.

DIGESTION TL5

A weak salt based digest for base metals in organic or acidic soils.

DIGESTION TL6

Similar to TL1, but with a weaker leachant for dominantly non-particulate Au.

DIGESTION TL7

A relatively stronger acid digest to dissolve amorphous Fe and Mn oxide/hydroxide species. Elements lithologically generated also extracted. For enhanced anomaly definition in lieu of conventional soil geochemistry.

DIGESTION TL8

Similar to TL1 but modified to give improved recovery of base metals and uranium.

DIGESTION TL9

A modified Na pyrophosphate digest for humic and fulvic acid rich soils. Good for most elements. Significant amounts of Au and Ag recovered also.

DIGESTION TL10

Using 0.1M hydroxylamine hydrochloride to dissolve amorphous Mn oxides.

DIGESTION TL11

Using 0.25M hydroxylamine hydrochloride to dissolve amorphous Mn and Fe oxides.

DIGESTION TL12

Using 1M hydroxylamine hydrochloride to dissolve amorphous and crystalline Fe and Mn oxides.

DIGESTION TL13

Using 1M ammonium acetate (pH5) to dissolve carbonates and to de-sorb surface bound metal cations.

Digestion cost

TL0, TL1, TL2, TL3, TL5, TL6, TL7, TL8, TL9, TL10, TL11, TL12, TL13.	\$8.00 /sample
TL4	\$16.00 /sample

Elements by AAS

Method code TL0/AAS; TL1/AAS; TL2/AAS; TL3/AAS; TL4/AAS; TL5/AAS; TL6/AAS; TL7/AAS; TL8/AAS; TL9/AAS; TL10/AAS; TL11/AAS; TL12/AAS; TL13/AAS

Ag (0.01)	Cd (0.01)	Co (0.1)	Cr (0.05)	Cu (0.01)	Fe (0.02)	Mn (0.01)
Ni (0.05)	Pb (0.05)	Sb (0.05)	Te (0.1)	Tl (0.05)	Zn (0.01)	
						\$2.50 each

Elements by OES

Method code TL0/OES; TL1/OES; TL2/OES; TL3/OES; TL4/OES; TL5/OES; TL6/OES; TL7/OES; TL8/OES; TL9/OES; TL10/OES; TL11/OES; TL12/OES; TL13/OES

Al (0.1)	Ca (0.1)	Cr (0.1)	Cu (0.1)	Fe (0.1)	K (0.1)	Mg (0.1)
Mn (0.1)	Na (1) ¹	Ni (0.1)	P (1)	S (1)	Sc (0.1)	Si (0.5)
Ti (0.1)	V (0.1)	Zn (0.1)				

First element	\$7.50
Subsequent elements	\$0.75 each

Elements by MS - All detection limits are in **ppb** except where indicated

Method code TL0/MS; TL1/MS; TL2/MS; TL3/MS; TL4/MS; TL5/MS; TL6/MS; TL7/MS; TL8/MS; TL9/MS; TL10/MS; TL11/MS; TL12/MS; TL13/MS

Ag (0.05)	As (0.5)	Au (0.01)	Ba (0.001ppm)	Be (0.5)	Bi (0.1)
Cd (0.1)	Ce (0.01)	Co (0.5)	Cs (0.005) ¹	Cu (0.005 ppm)	Dy (0.01)
Er (0.005)	Eu (0.005)	Ga (0.1)	Gd (0.005)	Ge (0.5)	Hf (0.02)
Hg (0.5)	Ho (0.005)	In (0.01)	La (0.01)	Li (0.2)	Lu (0.005)
Mo (0.2) ²	Nb (0.02)	Nd (0.01)	Ni (0.005 ppm)	Pb (0.002 ppm)	Pd (2)
Pr (0.005)	Pt (0.05)	Rb (0.1) ¹	Re (0.005) ¹	Ru (0.05)	Sb (0.05)
Se (2)	Sm (0.01)	Sn (0.5)	Sr (0.1) ¹	Ta (0.005)	Tb (0.005)
Te (0.5)	Th (0.02)	Tl (0.05)	Tm (0.005)	U (0.02)	W (0.1)
Y (0.02)	Yb (0.01)	Zn (0.05 ppm)	Zr (0.1)		

First element	\$10.00
Subsequent elements	\$1.00 each
Hg as a subsequent element	\$2.50

For Digests TL4 and TL7, the ICP-MS detection limits are 10 times those shown above.

For Digests TL9, TL10 and TL11 the ICP-MS detection limits are 20 times those shown above.

For Digests TL12 and TL13 the ICP-MS detection limits are 100 times those shown above.

Detection limits may increase depending on the sample. This may typically occur when weak acids are applied to strongly alkaline soils and vice versa.

Lower limits of detection may be achieved for some elements under special operating conditions.

Note:

1. Na, Cs, Rb, Re and Sr not available by digestions TL1, TL6, TL8 and TL9.
2. Mo detection limit is 2ppb for digestions TL1, TL6 and TL8.

ANALYSIS OF BIOGEOCHEMICAL SAMPLES

Special preparation digestion and analysis for biogeochemical samples.

DIGESTION BVEG

Modified aqua regia digestion

Elements by OES

Method code BVeg/OES

Al (5)	Ca (5)	Cr (0.2)	Cu (0.2)	Fe (5)	K (10)	Mg (10)
Mn (0.5)	Na (20)	Ni (0.2)	P (10)	S (5)	Sc (0.1)	Ti (1)
V (0.2)	Zn (0.2)					

Elements by MS

Method code BVeg/MS

Ag (5ppb)	As (0.2)	Au (0.5ppb)	Ba (0.05)	Be (0.02)	Bi (5ppb)	Cd (5ppb)
Ce (5ppb)	Co (0.02)	Cs (1ppb)	Dy (5ppb)	Er (5ppb)	Eu (5ppb)	Ga (0.02)
Gd (5ppb)	Ge (0.05)	Hf (5ppb)	Hg (5ppb)	Ho (5ppb)	In (5ppb)	La (5ppb)
Li (0.02)	Lu (2ppb)	Mo (0.02)	Nb (0.01)	Nd (5ppb)	Pb (0.02)	Pd (2ppb)
Pr (2ppb)	Pt (1ppb)	Rb (0.01)	Re (5ppb)	Sb (0.01)	Se (0.02)	Sm (5ppb)
Sn (0.02)	Sr (0.01)	Ta (5ppb)	Tb (2ppb)	Te (0.02)	Th (5ppb)	Tl (5ppb)
Tm (5ppb)	U (5ppb)	W (0.02)	Y (5ppb)	Yb (5ppb)	Zr (0.05)	

Package price
Gold only

\$50.00 /sample
\$20.00 /sample

ENVIRONMENTAL METHODS

Our Environmental Laboratories analyse a wide range of environmental samples testing to government, regulatory and industry standards.

AQUEOUS SOLUTIONS

Liquid samples, whether natural waters, extracts, effluents, process liquids, digests or other samples supplied as aqueous solutions must be accompanied by some information regarding their matrix and any potential hazards. We regret that we are unable to commence the analysis until we have received this information.

When aqueous solution samples are received containing suspended or settled solids, the supernatant only is analysed (except for the determination of suspended solids and total solids), unless advice to the contrary is received.

There is no universal method of preservation or stabilisation of water or effluent samples. Each group of analyses has a different preservation requirement. Please consult Genalysis prior to sampling for advice on the appropriate methods.

Bottles can be supplied upon request.

Prices are per sample.

ANALYSIS OF NATURALLY OCCURRING WATER

1. Detection limits below are for direct analysis of sample as received, or at minimum levels of dilution.
2. Detection limits below are for samples with TDS <1000mg/l for MS, and TDS <5000mg/l for OES.
3. Elements by enhanced sensitivity OES are only available where TDS <100mg/l.

ANALYSIS OF EXTRACTS, EFFLUENTS, PROCESS WATERS AND OTHER SAMPLES SUPPLIED AS AQUEOUS SOLUTIONS

Samples containing elevated levels of metals, and/or chemicals often create interference problems. Such samples may have to undergo treatment or high dilution, before analysis is possible.

Detection limits for all elements will depend on final digest/dilution.

Elements by OES - All detection limits are in **mg/l**

Method code /OES

Ag (0.01)	Al (0.01)	As (0.05)	B (0.01)	Ba (0.01)	Bi (0.1)	Ca (0.01)
Cd (0.01)	Co (0.01)	Cr (0.01)	Cu (0.01)	Fe (0.01)	K (0.1)	Li (0.1)
Mg (0.01)	Mn (0.01)	Mo (0.01)	Na (0.1)	Ni (0.01)	P (0.1)	Pb (0.02)
S (0.1)	Sc (0.01)	Si (0.05)	Sn (0.1)	Sr (0.01)	Ti (0.01)	V (0.01)
Zn (0.01)	Zr (0.01)					

First element	\$10.00
Subsequent elements	\$2.00 each

Elements by enhanced sensitivity OES (EOES) - All detection limits are in **mg/l**

Method code /EOES

Ag (0.005)	Al (0.005)	B (0.005)	Ba (0.005)	Bi (0.02)	Ca (0.005)	Cd (0.001)
Co (0.002)	Cr (0.005)	Cu (0.001)	Fe (0.005)	Mn (0.001)	Ni (0.001)	P (0.05)
Pb (0.01)	Sn (0.02)	Sr (0.002)	Zn (0.001)			

First element	\$10.00
Subsequent elements	\$2.00 each

(If both “standard” and “enhanced” OES elements are reported, then the “first element” cost for the “enhanced” OES elements does not apply.)

Elements by MS - All detection limits are in **µg/l**

Method code /MS

Ag (0.01)	As (0.1)	Au (0.01)	B (10)	Ba (0.05)	Be (0.1)	Bi (0.005)
Cd (0.02)	Ce (0.002)	Co (0.1)	Cs (0.001)	Dy (0.002)	Er (0.001)	Eu (0.001)
Ga (0.02)	Gd (0.001)	Ge (0.1)	Hf (0.005)	Hg (0.1)	Ho (0.001)	In (0.002)
La (0.002)	Li (0.05)	Lu (0.001)	Mo (0.05)	Nb (0.005)	Nd (0.002)	P (20)
Pb (0.5)	Pd (0.01)	Pr (0.001)	Pt (0.01)	Rb (0.02)	Re (0.001)	Ru (0.01)
Sb (0.01)	Se (0.5)	Sm (0.002)	Sn (0.1)	Sr (0.02)	Ta (0.001)	Tb (0.001)
Te (0.1)	Th (0.005)	Tl (0.01)	Tm (0.001)	U (0.005)	W (0.02)	Y (0.005)
Yb (0.002)	Zr (0.02)					

First element	\$15.00
Subsequent elements	\$2.00 each

Ir (0.01 µg/l) Rh (0.005 µg/l)

First element	\$15.00
Second element	\$2.00

Br (5 µg/l) I (0.2 µg/l)

First element	\$40.00
Second element	\$5.00

Elements by enhanced sensitivity MS (EMS)

Method code /EMS

As (0.05 µg/l) Se (0.2 µg/l)

First element	\$15.00
Second element	\$2.00

Elements by CVAP

Method code /CVAP

Hg (0.2 µg/l) \$15.00

OTHER DETERMINATIONS

	Price per sample	Method code	Detection limit	APHA code
pH	\$7.50	/METER	0.1	4500 H B
Conductivity	\$7.50	/METER	0.01mS/cm	2510 B
TDS (calculated from conductivity)	No charge			
TDS (by evaporation)	\$25.00	/GRAV	20mg/kg	2540 C
Total solids	\$25.00	/GRAV	20mg/l	2540 B C
Suspended solids	\$36.00	/GRAV	5mg/l	2540 D
Resistivity (calculated from conductivity)	No charge			
Turbidity (NTU)	\$7.50	/NEPH	0.5	2130 B
Colour (Co-Pt scale)	\$7.50	/NES	5	2120 B
Total hardness (calculated from Ca and Mg)	No charge	/CALC	0.5mg/l	2340B
Total alkalinity (includes OH, CO ₃ , HCO ₃)	\$25.00	/VOL	1mg/l	2320B
Acidity	\$25.00		1mg/l	2310B
Chloride	\$18.00	/COL	5mg/l	4500-CI E
Chloride	\$18.00	/VOL	5mg/l	4500-CI B
Chlorate	\$25.00	/VOL	5mg/l	
Sulfate (calculated from S)	No charge			
Sulfide sulfur	\$50.00	/VOL	1mg/l	4500-S C F
Sulfite	\$50.00	/VOL	1mg/l	4500-SO ₃ B
Nitrate	\$25.00	/COL	0.1mg/l	4500-NO ₃ B H
Nitrite	\$25.00	/COL	0.01mg/l	4500-NO ₂ B
Ammonia (direct)	\$25.00		0.1mg/l	417B
Ammonia (distillation)	\$50.00	/COL	0.1mg/l	417A
Fluoride	\$18.00	/SIE	0.1mg/l	4500-F C
Iron (total)	\$20.00	ACID/OES	0.01mg/l	3030C
Manganese (total)	\$2.00 *	ACID/OES	0.01mg/l	3030C
Phosphorous (total)	\$2.00 *	ACID/OES	0.1mg/l	3030C
Iron (ferrous)	\$25.00			
Cyanide (total)	\$50.00	/COL	0.01mg/l	4500-CN C E
Cyanide (free)	\$25.00	/SIE	0.05mg/l	4500-CN D F
Cyanide (weak acid dissociable)	\$50.00	/COL	0.01 g/l	4500-CN I E
Thiocyanate	\$18.00	/COL	1mg/l	4500-CN M
Oil and grease	\$60.00			
Phenolic compounds (distillation)	\$60.00			
Orthophosphate	\$25.00	/COL	0.005mg/l	4500-P E
Hexavalent chromium	\$25.00	/COL	0.005mg/l	3500-Cr B
Specific Gravity (liquid pycnometer)	\$25.00			
ICP/MS				3125B
ICP/OES				3120B

APHA codes refer to "Standard methods for the examination of water and wastewater", 21st Edition 2005 except for ammonia which is from "Standard methods for the examination of water and wastewater" 18th Edition 1992.

* Price assumes Iron (total) is required

CHEMICAL POTABILITY OF WATER SAMPLES

Analytical package comprises

pH, Turbidity, Colour, Nitrate, Fluoride, TDS, As, Cd, Se, Hg, Pb, Cr, Cu, Mn, Ca, Mg, Al, Zn, Na, S, Fe, Sulfate and Hardness.

National Health and Medical Research Council guidelines for drinking water provided for comparison purposes.

Single sample submissions

\$350.00 /sample

Multiple sample submissions

Price on application

SOIL, ROCK AND SLAG EXTRACTION METHODS

WATER EXTRACTION

Method code W

Digestion cost \$7.50 /sample

ASLP EXTRACTION ACCORDING TO AS 4439.3-1997

Method code ASLP

Digestion cost \$36.00 /sample

TCLP EXTRACTION ACCORDING TO USEPA 1311

Method code TC

Digestion cost \$36.00 /sample

EXTRACTION ACCORDING TO USEPA 200.7 (Dilute aqua regia)

Method code K

Digestion cost \$12.00 /sample

EXTRACTION ACCORDING TO USEPA 3050 (Hydrogen peroxide)

Method code L

Digestion cost \$30.00 /sample

Refer to page 37 for elements available by OES and MS (detection limits will be higher).
Refer to page 38 for other determinations.

<i>Elements by OES</i>	First element	\$10.00
	Subsequent elements	\$2.00 each
<i>Elements by MS</i>	First element	\$15.00
	Subsequent elements	\$2.00 each
<i>Hg by cold vapour AAS</i>		\$15.00
<i>pH, EC</i>		\$7.50 each

ACID MINE DRAINAGE TESTING

ACID NEUTRALISATION CAPACITY (ANC) \$36.00 /sample

NETT ACID GENERATION (NAG) \$45.00 /sample

Includes cost of final pH only

Other pH and EC measurements \$7.50 each

SATURATION EXTRACT

Method code PASTE

Digestion cost \$12.00 /sample

CALCIUM CHLORIDE EXTRACT

Method code CACL

Digestion cost \$15.00 /sample

Refer to page 37 for elements available by OES and MS (detection limits will be higher).
Refer to page 38 for other determinations.

<i>Elements by OES</i>	First element	\$10.00
	Subsequent elements	\$2.00 each

<i>Elements by MS</i>	First element	\$15.00
	Subsequent elements	\$2.00 each

Hg by cold vapour AAS \$15.00

pH, EC \$7.50 each

Refer to page 28 for carbon and sulfur analysis.

GENERAL INFORMATION

SAMPLE DESPATCH

To assist with the processing of your samples please pre-email all existing assay instructions and any freight information you have available.

Samples submitted via freight companies, either on pallets or in bulka bags, must have the correct delivery address. The consignment note must be correctly completed.

Certain samples may require classification as dangerous goods, for the purpose of transport and storage, and it is the client's responsibility to ensure that they have classified, marked and transported their samples in accordance with the requirements of dangerous goods legislation.

We recommend that all submissions of samples are clearly labelled, packaged in a concise and systematic order and are accompanied by accurate and detailed paperwork. Consequently, all sorting costs are included in the preparation charges detailed in this brochure. To facilitate safe manual handling, we would appreciate that samples be packaged in units of not more than 25kg each. If the sample bags are more than 25kg, please label the bag accordingly. Sample submissions poorly labelled or packaged will incur additional sorting charges.

Sample submissions having incomplete or no submission sheets will not be processed until adequate written instructions are received from the client.

When requested and upon completion of sorting, sample reconciliation information for each batch of samples will be faxed or emailed to appropriate personnel; otherwise only significant discrepancies between submission sheets and actual samples received will be reported prior to commencement of the analysis. Any minor discrepancies will be noted on the analytical report.

Sample submission pads and pre-addressed stick-on labels are available upon request, at no cost. A sample submission form can either be filled in online and emailed to Genalysis or downloaded and printed (to be faxed) from our web site at www.genalysis.com.au.

The minimum information required on any sample submission sheet is: -

1. Client name
2. List or range of sample numbers
3. Sample preparation required
4. Elements required for analysis
5. Methods of analysis preferred
6. Result destination(s)
7. Electronic data format
8. Invoice destination
9. Sample storage requirements
10. **Appropriate warnings if any samples are potentially hazardous (Refer to page 7)**
11. Indication of any samples that may cause problems during the preparation or analysis. This includes the presence of normally trace elements at % levels, visible gold, graphitic shales, etc.

Please "flag" the bag containing the paperwork.

Your co-operation with sample submissions will eliminate unnecessary delays in turnaround.

IMPORTATION OF SAMPLES INTO WESTERN AUSTRALIA

Genalysis' Perth laboratory is an approved premises for the clearance, receipt and treatment of samples from overseas and interstate sources subject to quarantine. A nominal fee is charged for quarantine treatment. Other expenses related to the importation will be passed on at cost.

When despatching samples, it is essential that they are well packed, i.e. double bagged, tightly packaged with plenty of padding to ensure no damage during transportation. Do not overload cartons/boxes, 15-20kg maximum for easy handling. Avoid the use of timber products.

It is important that a consignment declaration/pro forma invoice accompanies the goods stating the following details. (This form may be downloaded from our web site.)

1. Your company details
2. Description of goods - i.e. rocks, soils etc.
3. Mass and number of items (same as on airway bill).
4. Airway bill (consignment number).
5. List any pre-treatments prior to despatching - i.e. drying, pulverising etc
6. Valuation of goods for customs purposes. (NB: Goods must be given a real value, e.g. \$10.00.)

If a batch of samples is hazardous, please send a dangerous goods form with the samples. To download the form, visit our website at www.genalysis.com.au. (Refer to page 7)

Once despatched, please fax or email us advice of consignment, airway bill and analytical instructions, with your reporting requirements. Visit our website to download or print a sample submission sheet at www.genalysis.com.au. This will expedite processing.

The quarantine treatment required for importation is to dry at 121°C core temperature for 2 hours, with all packaging to be treated also. This must be carried out prior to preparation and analysis. A nominal fee is charged for quarantine treatment. Other expenses related to the importation will be passed on at cost.

Sample packets can be supplied to overseas clients at cost.

For further information on quarantine procedures and documentation requirements, and advice on the freight of samples, please contact our Perth office.

Please note that the Australian Quarantine Inspection Service (AQIS) reserves the right to amend and introduce new import conditions when advised by Biosecurity Australia.

IMPORTATION OF WATER/LIQUID SAMPLES – INTERSTATE ONLY

(We are not able to import liquids from outside Australia)

Water/liquid samples from interstate sources are not subject to quarantine, but require a declaration which must include:

- Company letterhead (dated and signed by the sender who must also include their position/title within the company).
- What the liquid is.
- If the samples have been acidified, state the acid used and the volume and concentration of acid used.
- Where it is from (State or Territory).
- The approximate volume of each container.

Please attach the signed declaration to the outside of the consignment so that the declaration can be read should the samples be seized for inspection by WAQIS.

SERVICE FEES AND SURCHARGES

Genalysis does not charge an administration or batch fee, however there is a minimum invoice charge of \$150.00 for routine geochemistry and \$200.00 for all other work.

All prices in this brochure are calculated on the basis of multiple sample batches rather than individual samples; consequently single sample jobs will be invoiced at triple rates and submissions of two samples will carry a 50% surcharge.

When sample submissions include largely differing sample matrices and/or differing analytical requirements, they may be treated as separate submissions and multiple jobs may be generated for each discrete grouping, each possibly attracting minimum job fees or small batch size surcharges.

A waste disposal levy is added to the cost of those analyses that produce lead, alkaline or cyanide based solid or liquid waste that requires specific hazardous waste disposal protocols. This levy is not subject to any discounts.

A 50% surcharge is added to invoices where a NATA endorsed report is requested. Such a request must be made prior to, or at the time of, submitting the samples.

Discounts may apply for large batches – please contact Genalysis to discuss your needs.

All prices quoted in this schedule are in Australian dollars, and exclude Australian Goods and Services Tax.

TERMS AND CONDITIONS

Genalysis Laboratory Services Pty Ltd is a member of the Intertek Minerals Group, and as such the Intertek Minerals Services Terms and Conditions apply.

1. Unless otherwise specifically agreed in writing Intertek Minerals (hereinafter called "the Company") undertakes services in accordance with these general conditions (hereinafter called "General Conditions") and accordingly all offers or tenders of service are made subject to these General Conditions. All resulting contracts, agreements or other arrangements will in all respects be governed by these General Conditions, except only to the extent that the law of the place where such arrangements or contracts are made or carried out shall preclude any of the General Conditions and in such case such local law shall prevail wherever, but only to the extent that, it is at variance with these General Conditions.
 - 1.1 For the purposes of these conditions the term "Intertek Minerals" comprises all of the Intertek Minerals Subsidiaries including but not limited to Intertek, Intertek Minerals, Intertek Minerals Services, Intertek Robotic Laboratories (IRL), PT Intertek Utama Services (IUS), Intertek Testing Services (ITS), Genalysis Laboratory Services, Intertek Genalysis, Northern Territory Environmental Laboratories (NTEL), Transworld, McPhar Geoservices (Phils) Inc.
- 2.0 The Company is an enterprise engaged in the trade of inspection and testing. As such, it:
 - 2.1 carries out such standard services as are referred to in General Condition 6;
 - 2.2 renders advisory and special services as may be agreed by the Company and as referred to in General Condition 7; and
 - 2.3 issues reports and/or certificates as referred to in General Condition 8.
- 3.0 The Company acts for the persons or bodies from whom the instructions to act have originated (hereinafter called "the Principal"). No other party is entitled to give instructions, particularly on the scope of inspection or delivery of report or certificate, unless so authorised by the Principal and agreed by the Company. The Company will however be deemed irrevocably authorised to deliver at its discretion the report or the certificate to a third party if following instructions by the Principal a promise in this sense had been given to this third party or such a promise implicit follows from circumstances, trade custom, usage or practice.
- 4.0 The Company will provide services in accordance with:
 - 4.1 the Principal's specific instructions as confirmed by the Company
 - 4.2 the terms of the Company's Standard Order Form, Sample Submission Form and/or Standard Specification Sheet if used;
 - 4.3 any relevant trade custom, usage or practice; and
 - 4.4 such methods as the Company shall consider appropriate on technical, operational and/or financial grounds.

- 5.0
- 5.1 All enquiries and orders for the supply of services must be accompanied by sufficient information specifications and instructions to enable the Company to evaluate and/or perform the services required.
 - 5.2 Documents reflecting engagements contracted between the Principal and third parties, or third parties' documents, such as copies of contracts of sale, letters of credit, bills of lading, etc., are (if received by the Company) considered to be for information only, without extending or restricting the mission or obligations accepted by the Company.
- 6.0 The Company's standard services may include all or any of the following:
- 6.1 quantitative and/or qualitative inspection;
 - 6.2 inspection of goods, plant, equipment, packing, tanks, containers and means of transport;
 - 6.3 inspection of loading or discharging;
 - 6.4 sampling;
 - 6.5 laboratory analysis or other testing; and
 - 6.6 surveys and audits.
- 7.0 Special services where the same exceed the scope of standard services as referred to in General Condition 6 will only be undertaken by the Company by particular arrangement.
- Such special services are illustratively not exhaustively:
- 7.1 qualitative and/or quantitative guarantees;
 - 7.2 supply of technicians and other personnel;
 - 7.3 pre-shipment inspection under government mandated import or customs schemes; and
 - 7.4 advisory services.
- 8.0
- 8.1 Subject to the Principal's instructions as accepted by the Company, the Company will issue reports and certificates of inspection which reflect statements of opinion made with due care within the limitation of instructions received but the Company is under no obligation to refer to or report upon any facts or circumstances which are outside the specific instructions received.
 - 8.2 Reports or certificates issued following testing or analysis of samples contain the Company's specific opinion on those samples as received only but do not express any opinion upon the bulk from which the samples were drawn. If an opinion on the bulk is requested special arrangements must be made in advance with the Company for the inspection and sampling of the bulk.

- 9.0 The Principal will:
- 9.1 ensure that instructions to the Company and sufficient information are given in due time to enable the required services to be performed effectively;
 - 9.2 procure all necessary access for the Company's representatives to enable the required services to be performed effectively;
 - 9.3 supply, if required, any special equipment and personnel necessary for the performance of the required services;
 - 9.4 ensure that all necessary measures are taken for safety and security of working conditions, sites and installations during the performance of services and will not rely, in this respect, on the Company's advice whether requested or not;
 - 9.5 take all necessary steps to eliminate or remedy any obstruction to or interruptions in the performance of the required services;
 - 9.6 inform the Company in advance of any known hazards or dangers, actual or potential, associated with any order or samples or testing including, for example, presence or risk of radiation, toxic or noxious or explosive elements or materials, environmental pollution or poisons; and
 - 9.7 fully exercise all its rights and discharge all its liabilities under any related contract whether or not a report or certificate has been issued by the Company failing which the Company shall be under no obligation to the Principal.
- 10.0 The Company shall be entitled at its discretion to delegate the performance of the whole or any part of the services contracted for with the Principal to any agent or subcontractor. Where deemed appropriate by the company, prior consent will be sought from the Principal.
- 11.0 If the requirements of the Principal necessitate the analysis of samples by the Principal's or by any third party's laboratory the Company will pass on the result of the analysis but without responsibility for its accuracy. Likewise where the Company is only able to witness an analysis by the Principal's or by any third party's laboratory the Company will provide confirmation that the correct sample has been analysed but will not otherwise be responsible for the accuracy of any analysis or results.
- 12.0
- 12.1 The Company undertakes to exercise due care and skill in the performance of its services and accepts responsibility only where such skill and care is not exercised.
 - 12.2 The liability of the Company in respect of any claims for loss, damage or expense of whatsoever nature and howsoever arising in respect of any breach of contract and/or any failure to exercise due skill and care by the Company shall in no circumstances exceed a total aggregate sum equal to Fifteen (15) times the amount of the fee or commission paid or payable in respect of the specific service or test required under the particular contract with the Company which gives rise to such claims, or US\$15,000, whichever is least, provided however that the Company shall have no liability in respect of any claims for indirect or consequential loss including loss of profit and/or loss of future business and/or loss of production and/or cancellation of contracts entered into by the Principal. Where the fee or commission payable relates to a number of services and a claim arises in respect of one of those services the fee or commission may be apportioned for the purposes of this paragraph by reference to the estimated time involved in the performance of each service or the value of the individual services.

- 12.3 The limit of liability of the Company under the terms of Condition 12.2 may be increased upon request received by the Company in advance of the performance of the service to such figure as may be agreed upon payment of additional fees equal to an appropriate fraction of the increase in such compensation or as may be agreed upon.
- 13.0 The Principal shall guarantee, hold harmless and indemnify the Company and its officers, employees, agents or subcontractors against all claims made by any third party for loss, damage or expense of whatsoever nature and howsoever arising relating to the performance, purported performance or non-performance of any services to the extent that the aggregate of any such claims relating to any one service exceed the limit mentioned in Condition 12.
- 14.0 Every officer, employee, agent or subcontractor of the Company shall have the benefit of the limitation of compensation and the indemnity contained in these General Conditions and so far as relates to such limitations any contract entered into by the Company is entered into not only on its own behalf but also as agent and trustee for every such person as aforesaid.
- 15.0 In the event that any unforeseen problems or expenditure arise in the course of carrying out any of the contracted services the Company shall be entitled to make reasonable additional charges to cover additional time and cost necessarily incurred to complete the service.
- 16.0
- 16.1 The Principal will punctually pay not later than Thirty (30) days after the relevant invoice date or upon receipt of invoice where credit is not extended or a credit limit is exceeded or within such other period as may have been agreed in writing by the Company all proper charges rendered by the Company failing which interest will become due at the rate of Eighteen per cent (18%) per annum or one and a half percent (1.5%) from the date of invoice until payment.
- 16.2 The Principal shall not be entitled to retain or defer payment of any sums due to the Company on account of any dispute, cross claim or set off which it may allege against the Company.
- 16.3 In the event of any suspension of payment arrangement with creditors, bankruptcy, insolvency, receivership or cessation of business by the Principal the Company shall be entitled to suspend all further performance of its services forthwith and without liability.
- 17.0 In the event of the Company being prevented by reason of any cause whatsoever outside the Company's control from performing or completing any service for which an order has been given or an agreement made, the Principal will pay to the Company:
- 17.1 the amount of all abortive expenditure actually made or incurred; and
- 17.2 a proportion of the agreed fee or commission equal to the proportion (if any) of the service actually carried out and the Company shall be relieved of all responsibility whatsoever for the partial or total non-performance of the required service.
- 18.0 The Company shall be discharged from all liability to the Principal for all claims for loss, damage or expense unless suit is brought within twelve (12) months after the date of the performance by the Company of the service which gives rise to the claim or in the event of any alleged non-performance within three (3) months of the date when such service should have been completed.
- 19.0 The Company is neither an insurer nor a guarantor and disclaims all liability in such capacity. Principals seeking a guarantee against loss or damage should obtain appropriate insurance.
- 20.0 No alteration, amendment or waiver of any of these General Conditions shall have any effect unless made in writing and signed by an officer of the Company.

- 21.0 Upon completion of testing the company shall provide a report to the principal on the results of the testing. Where requested by the Principal provisional results may be provided however the Principal agrees that those results shall be subject to confirmation in a final report.
- 22.0 The company agrees to take reasonable measures to ensure that the results of Inspection or Testing on behalf of the Principal and any other information provided to the company are kept confidential provided that this provision will not apply where the results or other information are in the public domain.
- 23.0 All samples submitted to the company remain the property of the principal. The company shall not be liable for any claim whatsoever relating to deterioration, contamination, damage or loss of samples. The Principal agrees to indemnify the Company in respect to all claims, demands or actions which may be made against the company with respect to deterioration, damage or loss of samples.
- 24.0 The Company shall have no responsibility for any action or inaction of any carrier, shipping or delivering any sample to or from the Company premises.
- 25.0 Samples shall be stored free of charge for a period of sixty (60) days after provision of the invoice. Upon expiration of the free storage period, unless otherwise directed by the Principal storage fees and/or disposal charges shall apply.
- 26.0 All data will be retained for a seven (7) year period; fees may apply for retrieval of data if longer than three (3) months after the final report date.